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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,419	06/20/2003	Hongxin Song	MP0275	6709
26200	7590	11/16/2005	EXAMINER	
FISH & RICHARDSON P.C. P.O BOX 1022 MINNEAPOLIS, MN 55440-1022			RIZK, SAMIR WADIE	
			ART UNIT	PAPER NUMBER
			2133	

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/600,419		SONG ET AL.	
	Examiner		Art Unit	
	Sam Rizk		2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-75 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-75 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTIONS

- Claims 1-75 have been submitted for examination
- Claims 1-75 have been rejected

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claims 45-52 of the invention are directed to non-statutory subject matter.

An article does not constitute “process, machine, manufacture or composition of matter” as stated in 35 USC 101 statute.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 2 recites the limitation "the input signal". There is insufficient antecedent basis for this limitation in the claim.
3. Claim 31 recites the limitation “the newly averaged signal”. There is insufficient antecedent basis for this limitation in the claim.

Information Disclosure Statement

4. The information disclosure statement filed 6/20/2003 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) **a list of all patents, publications, applications, or other information submitted for consideration** by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 102

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim1-75 are rejected under 35 U.S.C. 102(b) as being anticipated by Behrens et al. US patent no. 5329554 (Hereinafter Behrens).

5. In regard to claim 1 Behrens teaches;
- A signal processing apparatus comprising:
 - an input to receive a signal;

(Note: Fig.2, reference character **201** in Behrens)

- a buffer responsive to the input to store the signal;

(Note: Fig.3, reference character **304**, in Behrens)

- a detector responsive to the .input to interpret the original as discrete values; and

(Note: Fig. 3, reference character **312** in Behrens)

- an averaging circuit responsive the buffer and the detector to cause interpretation, by the detector during a retry mode, of a new signal comprising an average of a previous signal stored in the buffer and a current signal.

(Note: Fig. 6, reference characters **610,628,630,632, 634, 636 and 638**. and Col. 6, lines (30-68) in Behrens)

6. In regard to claim 2, Behrens teaches;

- The apparatus of claim 1, wherein the input signal comprises a read signal received from a storage medium.

(Note: Fig. 1, reference character **128** in Behrens)

7. In regard to claim 3, Behrens teaches;

- The apparatus of claim wherein the input signal comprises an analog signal, the apparatus further comprising a filter and an analog-to-digital .converter (ADC) coupled between the input and the detector.

(Note: Fig 2, reference characters 201, 204 and 206. and Col. 4, lines (13-35) in Behrens)

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8. In regard to claim 4, Behrens teaches;

- The apparatus of claim 3 wherein the buffer is coupled between the ADC and the filter.

(Note: Fig. 6, reference character **634** in Behrens0

9. In Regard to claim 5, Behrens teaches;

- The apparatus of claim 3, wherein the buffer is coupled between the filter and the detector.

(Note: Fig. 3, reference character **304** in Behrens)

10. In regard to claim 9, Behrens teaches;

- The apparatus of claim 1, further comprising a control circuit that determines whether the discrete values are adequately indicated based on comparison of interpretations of the new averaged signal and the current signal.

(Note: Fig. 7 and Col.7, lines (47-56) in Behrens)

11. Claim 10 is rejected for the same reasons as claim 9.

12. In regard to claim 11, Behrens teaches;

- apparatus of claim 1, further comprising a control circuit that causes the previous signal stored in the buffer to be an averaged input signal when two or more signals are obtained in the retry mode.

(Note: Fig. 6, Col. 6 lines (30-55) in Behrens).

13. In regard to claim 12, Behrens teaches;

- A storage device, comprising:

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- a storage medium;
- a head assembly operable to generate a read signal from the storage medium;
- a buffer that saves the read signal generated by the head assembly;
- a detector that interprets the read signal as discrete values;
- an averaging circuit responsive to the buffer and the detector;
- and
- a control circuit responsive to the averaging circuit to cause interpretation by the detector in a retry mode of a new read signal comprising an average of a previous read signal stored in the buffer and a current read signal.

(Note; Fig's 1-3 and 6-11 Behrens)

14. Claim 13, 38 and 55 are rejected for the same reasons as claim 3
15. Claim 14, 36, 37, 39 and 56-57 are rejected for the same reasons as claim 4
16. Claim 15 and 40 are rejected for the same reasons as claim 5
17. Claim 19 and 42 are rejected for the same reasons as claim 9.
18. Claim 20 is rejected for the same reasons as claim 10.
19. Claim 21 is rejected for the same reasons as claim 11.
20. In regard to claim 22, Behrens teaches;
 - A method comprising;

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- interpreting an input signal as discrete values; and in response to an inadequate signal, averaging multiple signals to improve interpretation of the input signal.

(Note: Fig's. 4 and 5 in Behrens)

21. Claims 23, 26, 28, 34, 45-47, 53 and 64-66 are rejected for the same reasons as claim 1.

22. Claim 24 is rejected for the same reasons as claims 4-5.

23. Claim 28 is rejected for the same reasons as claim 1.

24. In regard to claim 30, Behrens teaches;

- The method of claim 28, wherein determining whether the discrete values are adequately indicated comprises comparing interpretations of the averaged signal and of the second signal.

(Note: Col. 2, lines (10-45) in Behrens)

25. Claims 30-33, 43-44, 50, 52, 60-63, 68, 70 and 72-75 are rejected for the same reasons as claim 30.

26. In regard to claim 35, Behrens teaches;

- The system of claim 34, wherein the means for storing data comprises magnetic means for storing data.

(Note: Col. 1, line 25 in Behrens)

27. Claim 54 is rejected for the same reasons as claim 2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behrens as applied to claims 6-8 above, and further in view of Applicant Admitted Prior Art Betti European patent No. EP 1 271 509 A1 (Hereinafter Betti)

28. In regard to claim 6, Behrens teaches all the limitations in claim 3.

However, Behrens does not explicitly teach the detail (FIR) of digital filter;

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- The apparatus of claim 3, wherein the filter comprises a finite impulse response (FIR) digital filter coupled between the ADC and the detector.

Betti, in an analogous art, of detecting and correcting errors in a magnetic recording channel of a mass storage system teaches the FIR implementation (Note: Fig. 6, reference character **22** in Betti)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Behrens with the teaching of Betti to include details of the FIR digital filter.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized the need to reduce phase distortion.

29. In regard to claim 7, Behrens teaches all the limitations in claim 1.

However, Behrens does not explicitly teach;

- The apparatus of claim 1 further comprising an error correction circuit responsive to the detector and the averaging circuit to provide a signal quality metric that governs which signals.

Betti, in an analogous art, of detecting and correcting errors in a magnetic recording channel of a mass storage system teaches the details of the Error identification and correction method (Note: Fig. 6, reference character **47** in Betti)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Behrens with the teaching of Betti to include details of the Error identification and correction method. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized the need to combine SOVA and the averaging circuit to improve signal robustness.

30. In regard to claim 8, Betti teaches;

- The apparatus of claim 1, wherein the detector comprises a Viterbi detector.

(Note: Fig. 6, reference character **39** in Betti)

31. Claims 16, 25, 48, 58 and 67 are rejected for the same reasons as claim 6.

32. Claim 17 is rejected for the same reasons as claim 7.

33. Claims 18, 27, 29, 41, 49, 51, 59-60, 69 and 71 are rejected for the same reasons as claim 8.

Conclusion

34. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Kim et al. US patent no. 6163517 teaches signal detection method of data recording/reproducing apparatus and device.
- Howell US patent no. 5081547 teaches apparatus and method for automotive adjustment of read amplitude threshold in a digital tape drive.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Rizk whose telephone number is (571) 272-8191. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819.

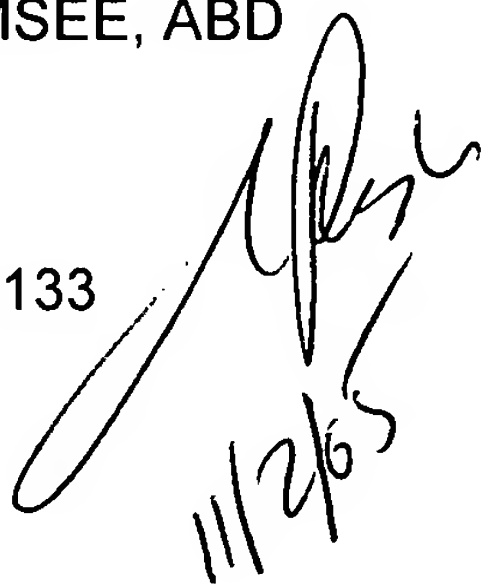
The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronics Business Center (EBC) at 866-217-9197 (toll-free)

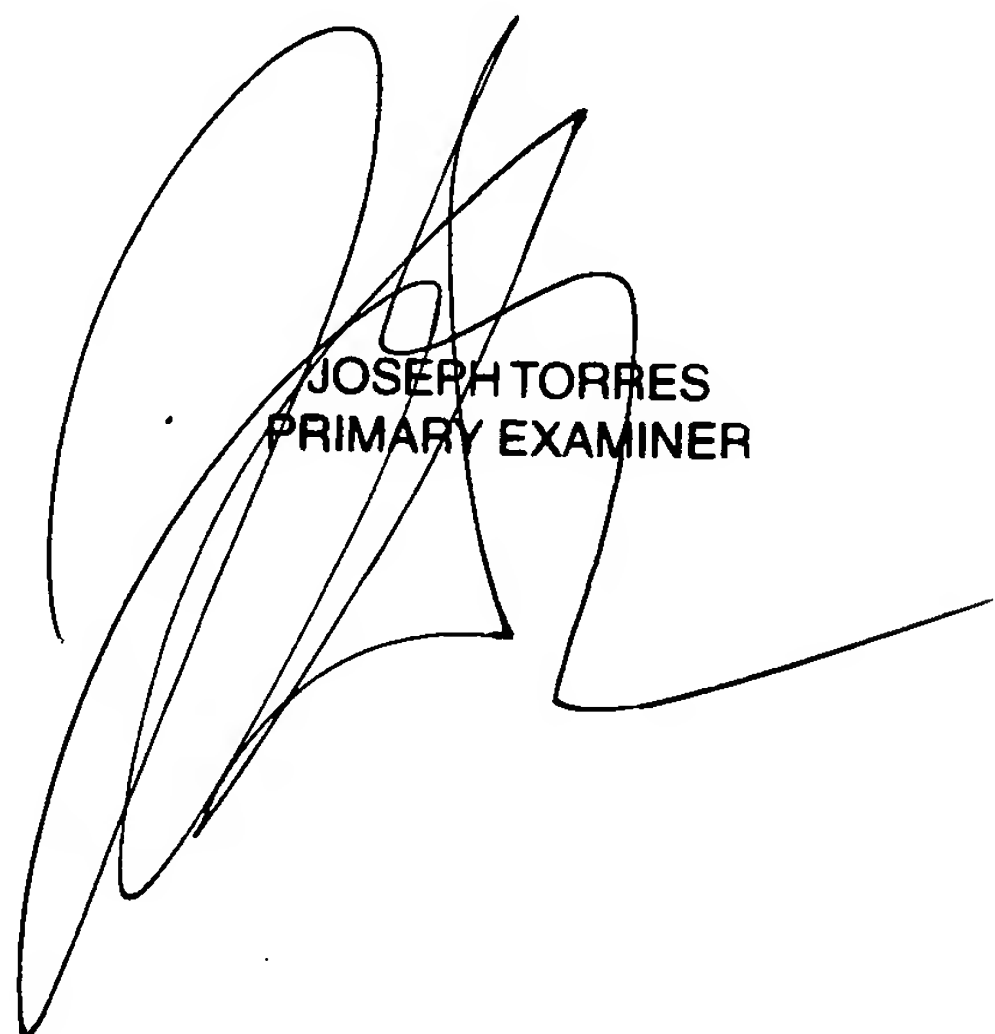
Sam Rizk, MSEE, ABD

Examiner

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11/2/05



JOSEPH TORRES
PRIMARY EXAMINER